Zirconium-Based UiO-66 Membrane for Pervaporation of Water/Alcohol

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Zirconium based UiO-66, a sub-class of metal-organic frameworks (MOFs), has attracted attention due to its high thermal and chemical stability. However, only a small number of papers have been reported because synthesizing defect-free and well-intergrown UiO-66 membrane is a challenging work. In this work, UiO-66 membranes were synthesized on α-alumina discs by secondary growth method. Mixture of DMF and acetone was used as solvent for synthesizing UiO-66 membrane. In acetone, zirconium ion forms [$ZrOCl_2$-] cluster, which enhance the synthesis of UiO-66 membrane. XRD, SEM, CO_2/N_2 gas permeation and pervaporation test were carried out for characterization. Pervaporation result shows that UiO-66 membrane is a promising candidate for water/alcohol separation.